

7mm secondary focus receiver (33500-50000 MHz)

This is a 4-channel two horn system for continuum, spectroscopy and VLBI observations.
Attention: When frequencies lower than 35 GHz are selected, the receiver operates in double sideband mode for some parts of the observed bandpass. Please contact staff for advice.

Calibration Information

This are preliminary results from first tests and can easily be off by 10 or 15 %.

| Frequency [GHz] | Channel | Polarisation | Tcal [K] | Tsys [K] | Sensitivity [K/Jy] | SEFD [Jy] | Aperture Eff. [%] | TMB/S [K/Jy] | Main Beam Eff. [%] | FWHM [arcsec] | Last update |
|---|---------|--------------|--------------|----------|--------------------|-----------|------------------------|--------------|--------------------|---------------|-------------|
| 35.75 | A | LCP | 7.5 | 77 | 0.76 | 102 | 26 | 1.6 | 47 | 24.4 | May 2018 |
| 35.75 | B | RCP | 6.9 | 83 | 0.75 | 112 | 26 | 1.6 | 47 | 24.5 | May 2018 |
| 38.25 | A | LCP | 9.3 | 90 | 0.62 | 145 | 22 | 1.6 | 38 | 22.5 | May 2018 |
| 38.25 | B | RCP | 9.1 | 94 | 0.66 | 143 | 23 | 1.6 | 40 | 22.6 | May 2018 |
| 42.75 | A | LCP | 9.5 | 84 | 0.76 | 110 | 26 | 1.5 | 50 | 20.9 | May 2018 |
| 42.75 | B | RCP | 8.7 | 85 | 0.77 | 111 | 27 | 1.5 | 50 | 21.1 | May 2018 |
| 44.1 (narrow band) | A+B | LCP+RCP | 13 | 100 | 0.66 | 140 | 23 | 1.67 | 40 | 19.5 | Dec 2019 |
| 45.25 | A | LCP | 8.5 | 99 | 0.63 | 156 | 22 | 1.5 | 42 | 19.7 | May 2018 |
| 45.25 | B | RCP | 8.2 | 103 | 0.65 | 159 | 22 | 1.5 | 47 | 19.8 | May 2018 |
| normalized Gain curve (G = A0 + A1·Elv + A2·Elv2) | | | | | | | Observed in | | confirmed | | |
| A0 = 0.897 | | | A1 = 5.93E-3 | | A2 = -8.52E-05 | | Below 40 GHz, Aug 2018 | | | | |
| A0 = 0.897 | | | A1 = 7.85E-3 | | A2 = -1.5E-04 | | Above 40 GHz, May 2018 | | | | |

Comments:

- The new gain curves were corrected for opacity.
- Opacity correction was done with a zenith opacity of 0.06-0.08. Typical zenith opacities under good weather conditions are around 0.07 to 0.1 at 42 GHz.
- For informations about the old parameters please contact Uwe Bach (ubach_at_mpifr.de).

Version description for OBSINP

| RX Name | Wavelength [cm] | Frequency (center) [GHz] | Nr. of Horns |
|------------------------------|---|--------------------------|--------------|
| S7mm double beam RX | 0.7 | 33.5-50.0 (42.0) | 2 |
| Version: | Comment | | |
| 1. Continuum (BW: 2.5 GHz) | Broad Band Continuum | | |
| 2. Line (BW: 2500 MHz) | Spectroscopy/Continuum using optical IF | | |
| Horn offsets [arcsec] | 107.7,-451.8; 219.2,-451.8 | | |

Channel assignment in the MBFITS data files

Note that the narrow line and VLBA IF channels are usually only available when the specific line version of the receiver was selected. In addition for most receivers with narrow line channels the cables at the patch board need to be connected by the receiver group.

To select different channel numbers in OBSINP, the online plot, or the toolbox the numbers have to be specified like c(1)+c(2) to add channel 1 and 2. E.g. channel 1 and 2 contain the LCP and RCP broadband channels, then "OnPlot pen='c(1)+c(2)'" or "toolbox use='c(1)+c(2)'" will select these channels. In OBSINP the pen can be directly specified in the receiver selection menu.

Abbreviations:

SB: narrow band channel (Schmalband-Kanal), 100 MHz band width

BB: digital broad band channel (Breitband-Kanal), band width varies for different receivers

VLBA: VLBA IF, 500 MHz band width

BW: band width

TP: total power

| 7mm SFK dual horn receiver | | | |
|-----------------------------------|---------|------|--------------|
| Channel | IF | Pol. | Comment |
| 1 | 2.5 GHz | LCP | TP A, horn 1 |
| 2 | 2.5 GHz | RCP | TP B, horn 1 |
| 3 | 2.5 GHz | LCP | TP A, horn 2 |
| 4 | 2.5 GHz | RCP | TP B, horn 2 |

Spectroscopy modes and resolution

To be done.

Tcal and Tsys measurements

To be done.

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